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FLORA OF LOWER CAPE COD; THIRD NOTE.

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IN my two notes on the plants of Cape Cod¹ I gave a general account of those conditions in the town of Eastham, Massachusetts, that would be likely to affect its flora, and also gave some notes as to the relative representation of different families, and the occurrence or non-occurrence of particular species. As to the first, there is nothing now to add, but as a result of another year's observations from May to September, 1910, I have something to add to the second. What I have observed this year shows that final conclusions cannot be drawn from anything but long-continued study; that the unexpected is always happening; and that there is a vast difference between positive and negative evidence. If you have found a certain plant in a certain place, you can safely say that it occurs there; if you have looked for it for years and not found it, it is not safe to say that the plant does not grow there. An illustration of this is the case of *Monotropa*. In the years 1906 to 1909 I had been watching for our two species of the genus, but unsuccessfully, and was fairly well convinced that they were not to be found in Eastham. But on the fifth of September, 1910, I began to see them frequently in places where I had often been before. There had been a rainy day, and as soon as the sunshine came again, the *Monotropas* came pushing up through the pine needles. These colorless plants always have a resemblance to mushrooms in appearance, and I was now struck

¹ On the flora of lower Cape Cod, RHODORA, Vol. XI, p. 125; Flora of lower Cape Cod; supplementary Note, RHODORA, Vol. XII, p. 8.

by another resemblance, their sudden growth under favorable conditions. In some places there were clumps of *M. uniflora*, twenty-five stems or more, 15 cm. high, the whole growth of which could not have taken more than the two or three days since the rain began; they had not grown through the layer of pine needles, but had pushed it up; the layer of needles rested on the top of the clump, but so loosely that a moderate rain would soon bring it down. After that I saw *M. uniflora* and *M. Hypopitys* everywhere in the pine woods.

Among the plants which I mentioned in my first note as not having been found in Eastham, but which I collected this season, are *Asclepias syriaca* and *Spiraea latifolia*, but neither was common. Of the *Spiraea* there were perhaps a dozen individuals, close together, but unusually well developed, each one and a half to two meters high. They were on land recently reclaimed from the influence of the sea, and everything in that station was larger than the normal. Nothing in this year's collecting invalidates the list that I gave of genera that one would expect, but that I did not find; *Rudbeckia*, *Arctium*, *Geranium*, *Thalictrum*, *Anemone*, *Aquilegia*, *Berberis*, *Desmodium* and *Crataegus*; to these I can add *Agrimonia*, *Aralia*, *Arisaema*, *Leontodon*, *Mimulus*, *Nepeta*, *Osmorhiza*, *Sanicula*, *Saxifraga*, *Urtica*, *Veronica*, and *Vicia*. While it is likely that representatives of some of these genera may yet be found here, it may be fairly assumed that the conditions are not favorable to them. Nearly all the species that this year's collecting added to the list belong to the category of "specialties" as understood in my first note, species found only in limited stations; among them *Myriophyllum humile*, *Sagittaria latifolia*, *Polygonum Muhlenbergii*, *P. sagittatum*, *Apocynum androsaemifolium*, and *Helianthus divaricatus*; none of them worthy of much note elsewhere, and here only on account of their scarcity and isolation. Of marine species, only one is to be noted, *Suaeda maritima*; in previous years all my *Suaeda* was *S. linearis*, this year all *S. maritima*; probably both species are common, but I had not noticed the distinction. Of the "domestic species" I can note *Euphorbia maculata*; I had been on the watch for this species, so common in most places, but it was not until September of this year that I found it; there was only a single plant, colored bright red, but without a trace of a spot on the leaves. Of *Taraxacum erythrospermum* I found two plants only, and of *Anthemis arvensis* var. *agrestis* only one. *Eragrostis megastachya* was common near my house. It is a handsome

grass, and the Manual speaks of it as common, but it has not been common for a very long time; when the flora of Middlesex County was compiled by Mr. Dame and myself, we could find only three localities in the county, two in mill waste and one in a dump. In my first note I mentioned *Plantago aristata* var. *Nuttallii*, a variety not in the Manual; in this variety the spikes are short and few-flowered, and the whole plant is much smaller than in typical *P. aristata*. This year I found both forms in abundance growing together, and in an uninterrupted series from the largest to the smallest; the distinction seems hardly justified. *Physalis pruinosa* was not uncommon in sandy roads; the berry is a rather bright yellow. To the species of *Solidago* already mentioned I can add *S. bicolor*, but only a few scattered plants observed; *S. puberula* is more common than I supposed. *Gerardia purpurea* and *G. pedicularia* occur, in addition to *G. paupercula*, already noted; and *Ranunculus sceleratus* can be added to *R. repens*. The total absence of *Desmodium* is all the more noticeable now that I have *Lespedeza Stuvei* and *L. procumbens* to add to *L. capitata*, all well developed and not uncommon. Eight miles up the Cape, at Brewster, where there is some approach to more ordinary conditions, *Desmodium* is found to a considerable extent, but it is all one species, *D. obtusum*. When we consider the great variety of *Desmodiums* found over nearly all New England, it is evident that the special Cape Cod conditions are distinctly unfavorable to this genus.

The common *Asclepias* in Eastham is *A. amplexicaulis*, but in some respects the plants did not agree exactly with the description in the Manual, according to which the leaves are very obtuse or retuse. In no case did I find a leaf with a retuse apex, and in some cases it could hardly be called obtuse but in every instance the midrib terminated in a distinct mucro. I preserved quite a suite of specimens and submitted them to Prof. Fernald, who tells me that there is no doubt as to the determination, specimens from other localities having the same characters. The absence of mention of another character in the descriptions is easily accounted for, as it is to be seen to advantage only in the fresh plant; the midrib of the leaf is bright red, and there is a very narrow red margin, distinct enough by its bright color, but of hardly measurable width; it soon fades out in the dried plant. In this species the leaves are regularly in pairs, with a long peduncle between the highest pair and the inflorescence; but one plant had the leaves in whorls of three, with a single well-developed leaf at the base

of the umbel. Another plant had flowers of a pale cream color, instead of the usual greenish purple.

The genus *Hieracium* is a prominent feature of the flora of summer and early autumn, five species being represented, all native; there are none of the introduced species that are establishing themselves in other parts of New England. *H. marianum*, *H. scabrum*, *H. Gronovii* and *H. canadense* present no difficulties, but the fifth species, which I had called *H. venosum*, puzzled me not a little, when I compared a large number of specimens. Some of these agreed with the Manual description "leaves nearly entire, scarcely petioled, thin, *glabrous*, and often purple-veined or mottled *above*, glaucous underneath," but in other individuals the leaves bore, often abundantly, long whitish hairs. I was tempted to refer these to *H. Greenii*, but when I found on the same plant one leaf green and hairy, another of apparently the same age purple veined and smooth, I was tempted to doubt the distinctness of the two species; when Prof. Fernald showed me specimens of *H. Greenii* from the middle states, I saw that it was not my Cape Cod plant. Undoubtedly all the specimens in question belong to *H. venosum*, but the leaves of that species are more variable than had been supposed.

Like the two preceding summers, the summer of 1910 was quite dry, and many of the shallower ponds nearly or quite disappeared. In many of these ponds or pools *Nymphaea advena* abounds, and as the water became low I could examine with comfort plants that usually would be quite out of reach. In addition to the normal floating leaves on long petioles, there were everywhere submerged leaves with short petioles, practically resting on the bottom. I had never seen these before, and was struck by their abundance, forming a large, handsome rosette at the base of each cluster of petioles. The Manual says "thin submerged leaves seldom present" but here they were at least as abundant as the ordinary leaves. They are thin and finely "crimped" in radiating folds, much like the scallop shell of southern New England; the petiole is hardly half as long as the blade, and is green, while the blade is a beautiful dull purplish red. As the normal leaves were mostly old and decaying, I thought at first that these might be young leaves of the same kind, which would later come to the surface as the petioles lengthened, but I afterwards saw buds and young leaves of quite different appearance, the blade thick from the first, the petiole rapidly lengthening. Later I found the

Nymphaea growing in places where the water had quite disappeared though the mud was still wet; here could be seen the decaying petioles of the normal leaves, the blades having quite disappeared; leaves in shape quite like those of the submerged rosettes, but thicker and greener, were borne on very short petioles, standing out almost horizontally, but not resting on the mud. I suspect that the submerged leaves are formed as the water becomes unusually shallow, and are utilized as aerial leaves by the plant when, by the disappearance of the water, the ordinary floating leaves are no longer available. The time at my disposal was too short for me to watch some particular plant or group of plants, and so get certainty in the matter.

I have already noted at Brewster the occurrence of *Desmodium* as indicating an approach to more ordinary conditions; a day's collecting here showed several other species which have apparently reached their limit; *Chimaphila umbellata*, *C. maculata* and *Silene latifolia*, for instance. The most interesting station at Brewster was at the bay shore, where the ordinary upland vegetation stops as it meets the influence of salt water. Here is quite a broad zone of rank vegetation; one can wander through "forests" of *Hibiscus Moscheutos* about up to one's head; every time I see this plant in flower it is a new delight, and I cannot think of anything in our most fertile regions that surpasses a field of this in full bloom. Along with this were various overgrown grasses and sedges; *Echinochloa Walteri*, *Scirpus validus*, *S. cyperinus* and *Spartina cynosuroides*; the occurrence of this last constitutes an extension of range, as it had not before been reported north of Connecticut. I selected the smallest plant of this species I could find; to get it into press I had to cut it into four pieces, and it fully occupied four pressing sheets. This luxuriant marginal flora is found all along the inside of the Cape, but this Brewster station is at the same time fully representative and easily accessible; it is less than fifteen minutes walk from railroad station at East Brewster; after the scanty flora of the fields and roadsides, the botanist will find it a delightful surprise; if he visits it as I did in August or early September, he will hardly be able to resist the temptation to pick some of the *Hibiscus* for its beauty, but a very few plants of this, with specimens of the *Spartina* and *Scirpus*, will make quite a large armful, and he may be glad, as I was, to accept a "lift" from another collector who had been working in the neighborhood, and was driving to the R. R. station. His collection consisted of two barrels of clams, but his kindness in taking me and my collection was none the less wel-

come. At Brewster, in dry sandy ground, I found a *Cyperus* that we seldom see near Boston, but which is apparently common here, *C. Grayii*.

In addition to *Spartina cynosuroides* just mentioned, two other species are to be recorded, with extension of range. *Paspalum psammophilum* was found in a sandy field in Eastham; the Manual gives its range as "so. N. Y. to Del." but it cannot now be called new to New England, as it has recently been found on Nantucket.¹ The present Eastham station is, however, the first on the mainland of New England. The other species is not a native, but comes from Australia or New Zealand, regions that have contributed very little to our introduced flora. *Chenopodium carinatum* R. Br. was found at three stations in Truro and two in Eastham, September 9 and 10. It probably did not come directly from New Zealand, but from California, where it has become established in recent years. It is not likely that many readers of this note will find a description of this species in any work they have at hand, and it may be well to give its principal characters. In general, the species may be said to resemble *C. Botrys* L., being glandular-pubescent and aromatic and having small erect seeds. It is prostrate and freely branched; the leaves are 1-2 (rarely 3) cm. long, oblong-lanceolate and sinuate-pinnatifid; the axillary inflorescences are short or subglobose glomerules instead of loose panicles as in *C. Botrys*; and the tiny sepals are prominently thickened on the back. The genus *Chenopodium* is looked upon rather askance by botanists who are not specially Chenopodiologists (I hope I may be pardoned the word, not knowing whether it is here used for the first time); but the species in question is rather attractive in appearance, and not at all like the rank and weedy *Chenopodiums* that abound in waste, and too often in cultivated places. I think I have seen it the past year near Boston, but my Eastham plant was then still an undetermined species to me, and by the time I had learned its identity it was too late to look for it this season.

All my Cape Cod plants of this year's collecting, including some from Yarmouth and some from Mattapoissett, the latter not strictly belonging to the Cape, but growing under similar conditions, have been deposited in the herbarium of the New England Botanical Club, after being identified by Prof. Fernald, to whom my hearty thanks are due.

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¹ Bicknell, Plants of Nantucket, Bull. Torrey Bot. Club, Vol. XXXV, p. 182 (1908).